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THE PHENOMENON OF PROJECT OVERFUNDING ON ONLINE CROWDFUNDING PLATFORMS – ANALYZING THE DRIVERS OF OVERFUNDING

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Research

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Abstract

On online crowdfunding platforms, three stakeholder groups, i.e., platform operators, project founders, and funders, encounter each other and influence funding outcomes by their actions and behaviors. Interestingly, among the successfully funded projects, some projects are heavily overfunded. By our research paper, we address this phenomenon of project overfunding. Especially in reward-based crowdfunding, massive overfunding can lead to severe problems for project founders when vast amounts of rewards have to be delivered. Some people even argue that the amount of money that leads to overfunding should better be pledged to good but undervalued projects that fail to reach their funding goal. However, it is also a powerful mean to generate publicity and to sell products. In order to help understanding this phenomenon, we analyze its drivers. Our analysis gives evidence for all three stakeholder groups contributing to overfunding. We provide arguments for all three stakeholder groups to have certain egoistic incentives for a further backing of already funded projects instead of prioritizing a more demand-oriented distribution of funding. Our findings extend the understanding of funding processes on crowdfunding platforms and are of high interest for practitioners in the field.

Keywords: Crowdfunding, Online Platforms, Kickstarter, Project Overfunding, Altruism, Egoism.

1 Introduction

Online crowdfunding platforms offer both project founders and potential funders a virtual place to find and meet each other (Ingram et al., 2014; Belleflamme et al., 2014). Today, using an online platform for acquiring the necessary project funding is a valuable option for project founders besides traditional funding sources, such as banks, venture capitalists, or governmental initiatives. Crowdfunding platforms offer all the relevant services around creating a project website, presenting the project online, and coordinating the funding payments. Another valuable advantage of such established platforms is that they are already well-known to a considerable number of Internet users (Etter et al., 2013). This means that Internet users can come across a project and, then, may decide to back it by funding. Kickstarter, Indiegogo, and RocketHub are well-known examples for such crowdfunding platforms.

For project founders, it is important to know how they can support reaching the funding success of their crowdfunding campaigns, i.e., reaching a certain goal amount of funding. Therefore, research has dealt predominantly with two questions so far. First, research has investigated the reasons why funders pledge money to projects in order to understand the underlying intentions (e.g., Gerber et al., 2012; Kuo and Wu, 2014). Second, research has analyzed which factors contribute to funding success to explain how founders can design a more successful campaign (e.g., Mollick, 2014; Xiao et al., 2014; Xu et al., 2014; Koch and Siering, 2015). The empirical results, insights, and implications of these studies

help founders to plan and conduct a successful crowdfunding campaign and give valuable advice of how to design the project presentation in order to attract funding and reach the funding goal.

In our opinion, an optimal crowdfunding platform supports those projects that are worth funding and helps to distribute the sum of potential funding in a way that respects all stakeholders' interests in the best way as possible. However, looking at funding results on crowdfunding platforms makes obvious that some campaigns' amount of pledged funding does not just reach the funding goal but massively exceeds this goal. That is, some projects receive a funding that is distinctly higher than their defined funding goal while other projects that would also be worth funding fail to reach their funding goal (Malave, 2012). An example of extreme overfunding that has recently reached popularity represents the case of the Kickstarter crowdfunding campaign "Pebble Time - Awesome Smartwatch, No Compromises" (conducted in march 2015), which had a targeted funding goal of USD 500.000. The final funding of this campaign exceeded this goal by an incredible sum of USD 19.8 million − becoming the highest funding that has ever been reached on Kickstarter (Hope King, 2015).

Such extreme funding results have been discussed as potential functional weaknesses on crowdfunding platforms (Malave, 2012). However, overfunding can also be highly beneficial for those project founders that desire to generate publicity and to sell their products or services. Overfunding is also relevant for founders that plan a project with so-called stretched goals, e.g., a PC game that will contain more game levels according to the available (over)funding. Here, the level of overfunding decides on how much of the additional features can be implemented. Even the platform operators themselves benefit from overfunded campaigns through additional traffic they generate on the platform, the indirect promotion for the platform as well as higher resulting revenues. Thus, the question of how massive overfunding of some projects affects overall welfare is not easy to answer and has not yet been discussed intensively. Before effectively analyzing market quality, we hold it to be substantial to investigate the factors that lead to project overfunding. Therefore, by our research, we address the question of what are the drivers of project overfunding. Although some publications refer to overfunding as a phenomenon of crowdfunding (Malave, 2012; Mollick, 2014; Barbi and Bigelli, 2015; Gabison, 2015; Frydrych et al., 2014), research has not yet investigated the underlying reasons sufficiently. To close this research gap, we propose a research model, conduct an empirical analysis taking into account all three stakeholder groups, and discuss the drivers of project overfunding. Hereby, we reveal the influence of platform-, founder-, funder- as well as project-related aspects on overfunding.

Our research paper proceeds as follows. In a first step, we review the background of and the most important research on crowdfunding as well as related theories to allow for an optimal linkage to the insights of our research. Then, we characterize our data set that we have used for descriptive and empirical analyses. Next, we present our extensive analysis of project overfunding and its drivers. Herein, we provide a graphical pre-analysis, present our research model to explain overfunding, and evaluate this model using data from Kickstarter. Finally, we discuss the findings, address limitations, and conclude.

2 Background and Related Research

2.1 Online Crowdfunding Platforms

Crowdfunding platforms are so-called two-sided markets that intermediate between *project founders* searching for funding and *funders* willing to provide money (Belleflamme et al., 2014). Furthermore, they can be seen as the meeting place of three stakeholder groups, i.e., platform operators, project founders, and project funders (Valančienė and Jegelevičiūtė, 2014; Collins and Pierrakis, 2012). On such platforms, project founders create a campaign website to, first, advertize their project and, second, attract and convince potential funders to back the project by their pledge of funding. Typically, both a funding period (e.g., 30 days) and a funding goal (e.g., USD 20,000) have to be defined initially by the project founders. After the initially defined period of time, the crowdfunding campaign ends and the amount of pledged funding determines whether the campaign reached the funding goal or not.

Generally, crowdfunding can be categorized into five types (Abushaban, 2014; Rossi, 2014; Schramm and Carstens, 2014), which are *donation-based crowdfunding* (where funders support projects by funding without claiming any compensation), *reward-based crowdfunding* (where funders are compensated for funding by a non-monetary reward), *lending-based crowdfunding [crowdlending]* (where funders are compensated for funding by a later repayment and interest payments), *equity-based crowdfunding [crowdinvesting]* (where funders are compensated for funding by a share of equity), and *royalty-based crowdfunding* (where funders are compensated for funding by royalty payments for the use of a patents/licenses/etc.). According to the crowdfunding model, different outcomes of the campaign are possible (Wheat et al., 2013; Gerber et al., 2012; Cumming et al., 2014): the *all-or-nothing model* allows project founders to keep the amount of pledged money only if the funding goal is reached and the *keep-it-all model* allows project founders to get the amount of pledged money in any case. The platform Kickstarter, for example, applies an all-or-nothing model and allows for a combination of reward-based as well as donation-based funding. Concerning platform usage costs, platform operators define a fee pricing structure, that determines the costs for platform users. Typically, the platforms keep a fixed percentage, e.g., 4 or 5 per cent, of the collected funding.

2.2 Research on Crowdfunding Success and Overfunding

For project founders, it is especially important to know which factors support the successful funding of projects. Therefore, research has analyzed successfully and unsuccessfully funded projects to determine the success factors of crowdfunding. Accordingly, it has been confirmed that the higher the funding goal, the less likely is funding success (Koch and Siering, 2015; Mollick, 2014). A more extensive description text of the project presentations leads to a higher probability of successful funding (Koch and Siering, 2015; Barbi and Bigelli, 2015; Xiao et al., 2014). Also, the usage of media, i.e., pictures and videos, increases the success probability (Koch and Siering, 2015; Barbi and Bigelli, 2015; Xiao et al., 2014; Mollick, 2014). Furthermore, it has been shown that updating the projects by posts and giving further information on the project stages is also supportive (Mollick, 2014; Xu et al., 2014; Xiao et al., 2014). Moreover, Zvilichovsky et al. (2014) find indications that a project is more likely to be successfully funded if its founder has backed other projects by funding before. Also, founders' experience in form of previously created crowdfunding campaigns on the platform has a significant positive influence on campaigns' success (Zvilichovsky et al., 2014; Koch and Siering, 2015). Mitra and Gilbert (2014) analyze the language of project descriptions and find that there are typical phrases that lead to projects being more likely to be successfully funded. Moreover, it has been shown that campaigns with a shorter funding period are more likely to be successfully funded (Xiao et al., 2014; Mollick, 2014; Barbi and Bigelli, 2015). And, finally, Zheng et al. (2014) find indications that there are cultural differences in crowdfunding. They argue that findings for the USA need not to be necessarily the same for other geographical regions. In Chinese, e.g., they find a positive influence of the length of funding periods on funding success − in contrast to its negative influence in the USA.

Concerning the dynamic rise of funding, Mollick (2014) argue that an early growth of pledged funding leads to further funding by other funders because funding growth is seen as a signal of project quality. Moreover, researchers explain that social interconnection and social networks' dynamics function as multipliers and that communication via social networks supports funding success by spreading the word of mouth (Frydrych et al., 2014; Cheung et al., 2008; Hui et al., 2014).

Furthermore, research has discussed the intentions for projects founders to use crowdfunding. Certainly, founders use crowdfunding platforms to collect money (Gerber et al., 2012). But we also find other reasons like selling products, e.g., in a pre-selling campaign (Kuo and Wu, 2014), increasing communities' awareness and publicity (Gerber et al., 2012), establishing relationships (Gerber et al., 2012) and receiving support, validation as well as commitment (Gerber et al., 2012). Funders also have various intentions to participate in crowdfunding. For example, joining a crowdfunding community can be driven by a positive feeling as a result of being socially connected (Gerber et al., 2012). Individuals pledging money to projects can be interested in the project reaching its aim (Gerber et al., 2012;

Kuppuswamy and Bayus, 2013), e.g., building a monument/memorial, or focus on receiving the product that results from the project (Kuppuswamy and Bayus, 2013; Gerber et al., 2012; Haas et al., 2014), e.g., technical products, or intend to receive any other form of profit for their funding (Haas et al., 2014; Kuppuswamy and Bayus, 2013), e.g., future payments, or expect future acts of reciprocity from supported individuals (Zvilichovsky et al., 2014), or enjoy feeling content through helping and supporting others altruistically (Haas et al., 2014; Kuppuswamy and Bayus, 2013). Therefore, it can be distinguished principally between motives to "enhance the welfare of the needy" (altruistic) and motives to "somehow enhance a person's own welfare" (egoistic) (Bendapudi et al., 1996).

Among all successfully funded projects, there are some projects that exactly reach their goal while the funding of most projects exceeds the goal to a certain extent. Such projects are *overfunded*. In the literature, the term of overfunding is used in two slightly different ways. Principally, a project is called overfunded the moment its funding exceeds the goal (e.g., Frydrych et al., 2014). Sometimes, the term is especially used when a project's funding is considerably higher than its funding goal (e.g., Mollick, 2014). However, concerning overfunding, there have been only very few research findings so far. Mollick (2014) finds that overfunded projects tend much more to delays in delivering the promised rewards. And Malave (2012), in his paper, addresses the question of how Kickstarter could better cater the needs of its users by redesigning and changing some platform principles and model parameters. He also captures the idea that lowering overfunding could help to fund undervalued projects that otherwise fail to reach their goal. Recently, one first attempt of explaining overfunding has been made (Cordova et al., 2015). However, this paper suffers from several weaknesses. Many important factors, e.g., all founder-related aspects and all factors of project information disclosure, which already have been shown to be important for the explanation of funding results, have been completely disregarded. On the other hand, the number of funders and the logarithm of funders' average funding contribution have been included as explanatory variables. Obviously, these variables are highly correlated with the independent variable of overfunding because the sum of overfunding is the result of multiplying the number of funders with the mean funding contribution. Consequently, research has to adjust the model or to propose a different approach in order to identify the true underlying reasons for overfunding.

2.3 Related Theories

Whenever money or goods are exchanged, overall welfare and utility are influenced by activities and decisions of all individuals concerned. In the case of crowdfunding platforms, project founders, funders, and platform operators have an influence on the distribution of funding and compensations. While it is reasonable that individuals usually desire own optimal outcomes, it is much more difficult to determine when the optimal overall outcome is achieved. Especially interesting is the fact that projects are competing for funding (Burtch, 2011). The funding of a project has negative external effects on all other projects as these cannot receive this amount of money anymore. Such (uninternalized) externalities can be seen as a form of market failure (Williamson, 1971). In general, crowdfunding platforms are both open to the crowd and open to free funding decision making. As a result, funding outcomes are likely to be biased by market failure and need not to reflect optimal results.

In comparable context, Harrison and Wicks (2013) explain that overall performance cannot only be measured by revenues that are generated. Whenever many individuals and parties are concerned, a multi-stakeholder approach is necessary to measure performance and to estimate the overall utility of the outcome. Harrison and Wicks (2013) conclude that performance should be measured as the "total value created by the firm through its activities, which is the sum of the utilities created for each of a firm's legitimate stakeholders". Therefore, stakeholder theory (Freeman, 1994; Freeman et al., 2004) advise to regard responsibilities concerning all stakeholders whenever business is conducted or decisions are made. He et al. (2014), for example, discuss stakeholder theory in the context of crowdsourcing. In crowdsourcing, a task or problem is outsourced to the crowd in form of an open call that asks the crowd for solving the problem or completing the task (Brabham, 2008; Howe, 2006). He et al. (2014) demonstrate that in this crowd-based context various types of stakeholders with different spe-

cific attributes and interests can be found. That is, for an optimal overall outcome, all different types of stakeholders have to be considered and respected.

However, as long as platform rules do not ensure that all individuals contribute actively to an overall optimal outcome, every individual tend to maximize his or her own profits and benefits. Therefore, we suggest that theoretical aspects on individual behavior, decision making as well as egoism and altruism yield valuable indications and implications in the context of crowdfunding. All three stakeholders are confronted with many questions and decisions. For example, the funders have to choose projects that they find interesting and worth funding but also trustworthy (Hui et al., 2014; Lehner, 2013). The project founders have to decide on how to present the projects and on how to set the funding period and funding goal (Mollick, 2014; Xu et al., 2014; Xiao et al., 2014). And the platform operators have to determine key parameters of the crowdfunding model or decide on how campaigns are displayed on the platform website. In all such decisions, altruism and egoism are important driving forces. While egoism leads individuals to maximize own profits, the reasons for altruistic behavior are more complex (Andreoni, 1990). When explaining why individuals help others, it is often referred to the norm of reciprocity (Gouldner, 1960; Leeds, 1963). Reciprocity explains 'giving' as a compensation for having received something previously or in hope to receive something in future (Gouldner, 1960). However, apart from this explanation, research discusses other possible reasons for altruism, for example, friendship, respect, prestige, and social as well as psychological objectives (Olson, 2002). Concerning funders, we find both traces of egoism (e.g., funders focusing only on receiving the rewards) (Haas et al., 2014; Gerber et al., 2012) and traces of altruism (e.g., funders helping without taking rewards) (Haas et al., 2014). Thus, we assume that in crowdfunding especially aspects of egoism and altruism explain a large part of stakeholders' behavior and, thus, of funding outcomes.

3 Analyzing Drivers of Project Overfunding

3.1 Data set and data acquisition

For our descriptive and empirical analyses in the following sections, we use a data set of projects from the crowdfunding platform Kickstarter. This data set comprises successful project campaigns (i.e., projects that have reached their funding goal) as well as unsuccessful project campaigns (i.e., projects that have failed to reach their funding goal). We took an almost balanced data set of successful and unsuccessful projects going back from the end of November 2014. In total, we have collected 40,833 projects in our data base: 19,745 successful and 21,088 unsuccessful project campaigns.

On Kickstarter, projects are assigned to one of fifteen different categories: Art, Comics, Crafts, Dance, Design, Fashion, Film&Video, Food, Games, Journalism, Music, Photography, Publishing, Technology, or Theater, which we will regard in later analyses. Moreover, on Kickstarter, projects cannot only be denoted in USD − but projects in USD are noticeably more frequent. For our empirical analysis of overfunding, we use all successfully funded projects that are denoted in USD to avoid problems of currency conversion. This results into a final data set of 15,824 project campaigns.

3.2 Graphical pre-analyses

In a first step, we apply a graphical analysis of the crowdfunding data in order to gain initial insights into funders' funding behavior and its relation to overfunding. We examine the distribution of the amount of funding that crowdfunding campaigns have reached. Therefore, we do not regard the absolute amount of funding but we set the finally reached funding X into relation to the initially defined funding goal X_{goal} of the project, so that: $R_{fund} = X / X_{goal}$. For unsuccessfully funded projects, this funding extent R_{fund} ranges always in the interval of [0, 1[. Successfully funded projects always have a $R_{fund} \geq 1$, while a value of $R_{fund} = 1$ means that a project has exactly reached the funding goal. We define a project to be overfunded if $R_{fund} > 1$. In other words, the higher this extent of funding R_{fund} of a successfully funded project, the stronger it is overfunded.

For a graphical presentation of the distribution of R_{fund}, we slice the continuum into intervals of the size of 0.05. Figure 1 shows the resulting distributions of R_{fund} for the fifteen categories on Kickstarter. The resulting typical curves' shapes are in line with the research findings of Lu et al. (2014), Mollick (2014), and Kuppuswamy and Bayus (2013). These authors find that there are many projects that do not even start reaching funding dynamics and that most projects exceed their goal by only little margins. However, these authors do not distinguish explicitly between the different categories.

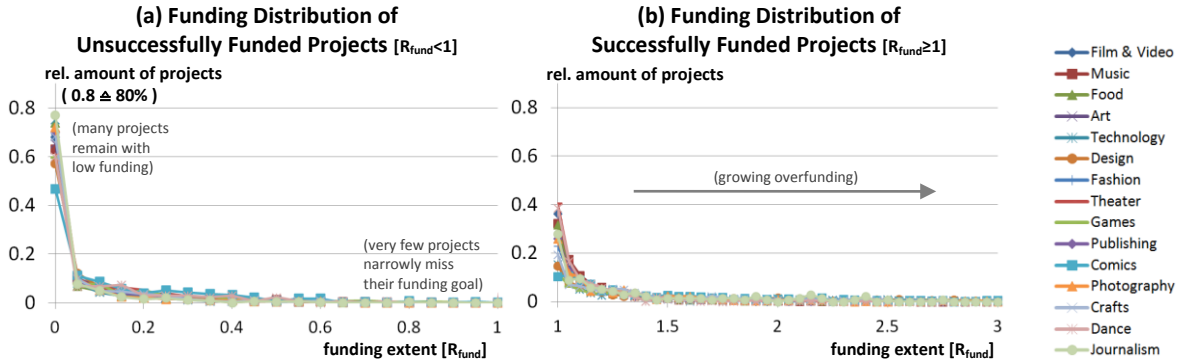

Figure 1. Distributions of funding extents according to categories

Although the curves of Figure 1 (b) are relatively flat, overfunding is not a niche phenomenon. The finally reached funding of about 27.5% of all successfully funded projects exceed the 2-fold of the original funding goal (17.5% exceed the 5-fold and 5.6% even exceed the 10-fold). Admittedly, the two graphs in Figure 1 do not allow to have a closer look on the curve shapes of the different categories. Thus, we zoom in on the curves of the successful project campaigns and find that there are characteristic differences in the distributions of R_{fund} of the different categories. In the graphs of Figure 2, we see that project categories differ noticeably concerning their distributions of R_{fund}. For a better interpretation, we may add that the higher a curve is on the left-hand side, the less projects in a category are overfunded. In contrast, the higher a curve is on the right-hand side, the more projects in a category show higher overfunding. For example, we find that the distribution of the funding extents R_{fund} of projects in the categories of Music or Dance show a relatively high occurrence rate of low overfunding (Figure 2, left graph) and low occurrence of strong overfunding (Figure 2, right graph). In contrast, the distribution for the category of Games or Design shows a relatively low occurrence rate of low overfunding and a higher occurrence rate of stronger overfunding. Here, a first explanation for projects of Dance and Music to be less overfunded might reflect that these offer less often attractive rewards, while projects of the categories Games or Design more often attract reward-focused funders.

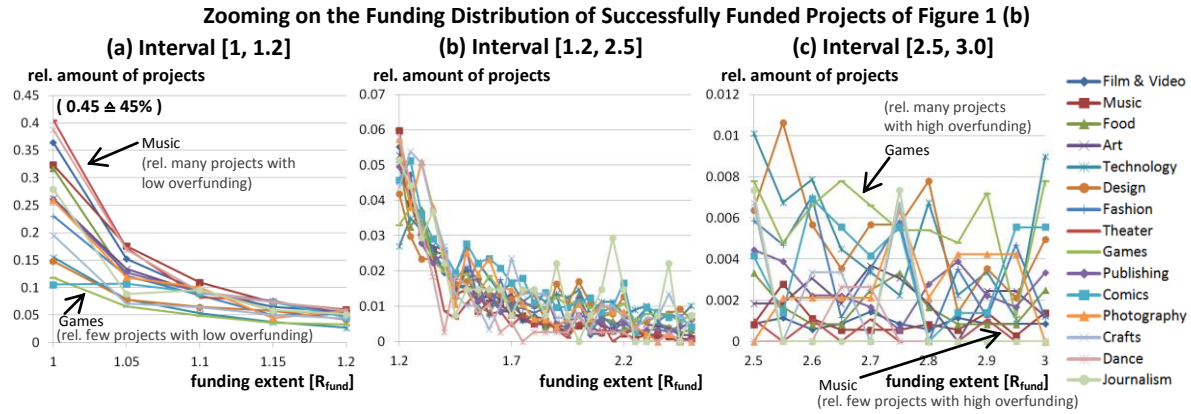

Figure 2. Distribution of funding extents according to categories (successfully funded projects)

On Kickstarter, both donation-based and rewards-based funding is possible. Hence, the projects on the platform are generally funded both partially reward-based, X_{rew}, and partially donation-based, X_{don}. Consequently, the total sum of funding results as $X = X_{rew} + X_{don}$. On Kickstarter, it can be distinguished how much a project has been funded by donation and how much funding has been given to the project in return for a funding compensation in form of a reward. Hence, for every project, this results into a specific relation between both funding types, so that the share of donation-based pledging is $S_{don} = X_{don} / (X_{rew} + X_{don}) = X_{don} / X$, which always takes values between zero and one including these borders, i.e., $S_{don} \in [0, 1]$. We analyzed this share of donation-based pledging S_{don} of successfully funded projects and distinguished again between the 15 project categories on Kickstarter. By this, we find noticeable differences between the distributions of S_{don} of the project categories.

For graphing the distribution of S_{don}, we slice the range of [0, 1] into intervals of the size of 0.05. Figure 3 shows the resulting distributions of S_{don} for the fifteen categories on Kickstarter. While we have in total 15 categories on Kickstarter, we present these in three separate graphs, each of which shows five categories. On the one hand, we decided to use this separation to improve visual clarity because a graph with 15 curves is difficult to interpret. On the other hand, by this separation, we want to show that we find different characteristic shapes of the curves. We see that the project categories reveal different distributions of the shares of donation-based funding. For a better interpretation, we may add that the higher a curve's shape is on the left-hand side of the graph, the more projects with a low donation-based funding are in the respective category. In contrast, the higher a curve's shape is on the right-hand side, the more projects with a higher donation-based funding are within the project category. This graphical analysis reveals that founders' funding behavior differs between project categories.

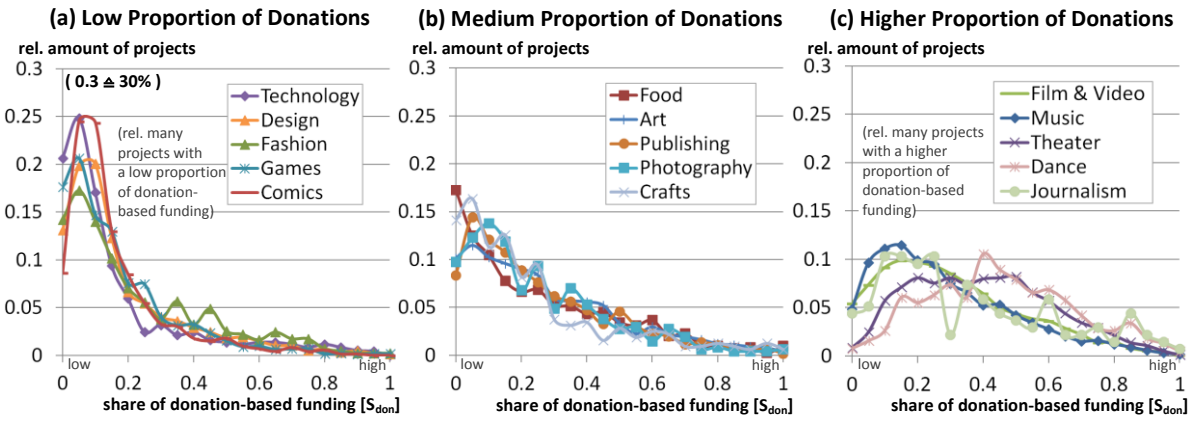

Figure 3. Different donating behavior according to the project categories

In the graph (a) of Figure 3, we find curves with a noticeable peak on the left-hand side. This means that in these five project categories one finds a relatively high number of projects with a very low level of donation-based funding. This implies that many funders of these projects decide to take a reward instead of giving money without a compensation, which represents a relatively more reward-focusing style of funding. In the graph (c), the curves show more even shapes with a relatively higher level of the curves on the right-hand side. The project categories in this graph include more projects with a higher level of donation-based funding. Thus, funding in these projects is less reward-driven. And for completeness, the projects in the categories of graph (b) are in between. Interestingly, by this grouping based on the share of donation-based funding, categories that are likely to create real products (Design, Fashion, etc.) and those of arts and culture (Music, Dance, etc.) are close together.

Analyzing the curves of the categories reveals that, interestingly, the same categories group together as in the analysis of the share of donation-based funding S_{don} in Figure 2. This lets us conclude that a low level of donation-based funding comes with a lower extent of overfunding. Thus, the extent of donation-based funding S_{don} helps to explain the extent of overfunding R_{fund} of successfully funded projects. We will verify this finding in the subsequent analyses.

3.3 Hypotheses

Our research aims at analyzing the drivers of project overfunding. Therefore, we hypothesize on the variables in our model as well as discuss their expected influence on projects' levels of overfunding. For clarity and a better overview, we have decided to form five groups of hypotheses (Figure 4).

Campaign Conditions: Research has shown that the funding goal is an important factor in explaining funding success (Koch and Siering, 2015; Mollick, 2014): the higher the funding goal, the less likely the campaign reaches its goal. We assume a similar effect on overfunding:

H1.1: The funding goal has a negative influence on project overfunding.

Concerning the duration of the campaigns, research has shown different results regarding its influence on funding success (Zheng et al., 2014). However, the vast majority of research finds that projects that successfully reach the funding goal have a shorter funding period (Mollick, 2014; Kuppuswamy and Bayus, 2013). Mollick (2014) explains that longer funding periods are interpreted as an indication of a lack of confidence among project founders. This leads to funders being more reluctant in funding. Hence, we assume a similar negative connection between funding duration and overfunding.

H1.2: The longer the funding duration, the less strong is the overfunding.

We also include aspects on campaigns' offered rewards, which function as funding compensations. We assume that a higher number of reward levels, i.e., a broader range of choice, will increase overfunding because more funders will find an appropriate compensation for their funding. Similar findings have been made in the context of funding success. Here, a broader range of choice has a positive influence on funding success (Crosetto and Regner, 2014; Barbi and Bigelli, 2015). However, the project founders have the possibility to limit each reward level to a certain maximum number of funders. In this case, only a pre-defined number of funders can select a certain reward. Therefore, we conclude that reward level limitations have a negative influence on overfunding.

H1.3: The more reward level are offered, the stronger is the overfunding.

H1.4: The use of reward level limitations inhibits project overfunding.

Project Information Disclosure: It has been shown that the length of project descriptions (Xiao et al., 2014; Koch and Siering, 2015), the number of pictures (Koch and Siering, 2015), and the provision of video material (Mollick, 2014; Koch and Siering, 2015; Xiao et al., 2014) have a positive influence on funding success. These factors lower information asymmetry between project founders and potential funders, which leads to more trust and a higher willingness to fund. Hence, we assume these factors to have a positive influence on overfunding because more funders will choose to fund. Moreover, it has been found that communication, e.g., by updates and comments on the crowdfunding project website, are positively related to funding success (Xiao et al., 2014). We are aware of the fact that comments do not only contain further information supplied by the project founder but a big part of these comments is also submitted by other platform users. However, we hold such communication to be a proxy for communication activities among potential funders in the community. Such communication could possibly recruit further funders. Therefore, we assume communication to increase overfunding.

H2.1: Textual information has a positive influence on overfunding.

H2.2: Media-based information has a positive influence on overfunding.

H2.3: The more communication, the stronger is the overfunding.

Founder-Related Aspects: Research has also analyzed the influence of founder-related aspects on funding success. Here, it has been found that the length of platform membership (Zvilichovsky et al., 2014), the number of friends (Mollick, 2014; Koch and Siering, 2015), the number of backed projects (Zvilichovsky et al., 2014), and the experience in form of previously founded projects (Koch and Siering, 2015; Zvilichovsky et al., 2014) positively influence funding success. We expect these variables to have similar effects of on project overfunding. Therefore, we hypothesize:

H3.1: The longer the founder is active on the platform, the stronger is the overfunding.

H3.2: The number of friends has a positive influence on overfunding.

H3.3: The more active the founder is on the platform, the stronger is the overfunding.

H3.4: The more project campaigns a founder has conducted, the stronger is the overfunding.

Platform-Related Aspects: Platform operators especially benefit from projects that are characterized by a relatively fast growing sum of pledged money (Agrawal et al., 2013). Thus, operators principally have an incentive to support fast-growing projects, e.g., by placing them in a prominent position on the website. Such a prominent placement promotes further funding (Do et al., 2012) and increases platform's revenue. Especially in the all-or-nothing model, platform operators are incentivized to place promising projects prominently on websites. Here, projects that to do not reach the goal do not receive the funding, which means no revenue for the platform. This is no general suspicion of platforms to influence funding results but should emphasize that platforms are theoretically able to use their impact to influence funding results. Not only by positioning projects on the website in a certain manner but also by marking the projects, for example, by labels implying that projects are "especially worth funding". Research has shown that recommendations on online platforms positively influence users' decision behavior (Senecal and Nantel, 2004). To show that such labels can further support overfunding, we include the so-called "staff pick" label on Kickstarter. Projects with such a label are funded by staff members of the Kickstarter team. We assume that such labels increase the awareness of potential funders towards the projects. Thus, we hypothesize that such labels drive overfunding.

H4.1: The platform is able to drive overfunding by indication of project quality.

Funding Behavior: On crowdfunding platforms, e.g., on Kickstarter, projects offer various rewards to the crowd as a compensation for funding. We expect that reward-focused funders tend to continue funding after the goal has been reached for the purpose of gaining personal benefits from the rewards. Here, funders predominantly focus on receiving the rewards instead of giving priority to helping projects reach their funding goal (Gerber et al., 2012). Such funders, who thereby show traces of egoistic behavior, tend to continue funding although the funding goal of a campaign has already been reached. On the contrary, there exist funders that fund projects for more altruistic reasons (Haas et al., 2014). These funders prioritize helping projects to reach their funding goal. Consequently, they do not greatly continue funding when the funding goal is reached. Therefore, we expect projects that attract relatively more donation-based funding to reveal less overfunding, while projects that attract relatively more reward-based funding will reveal stronger overfunding. Moreover, we assume differences in funding behavior between project categories. Specifically, we argue that different topics appeal different kinds of people. People that are interested in consumption (of, e.g., technological products and fashion) are more likely to purchase rewards than people that are interested in arts or culture who might focus more on a project to reach its aim. As a result, projects of certain categories tend to higher overfunding.

H5.1: Funders cause a lower overfunding, if a project is more attractive for donations.

H5.2: There are typical project categories, the projects of which tend to more overfunding.

3.4 Research Model

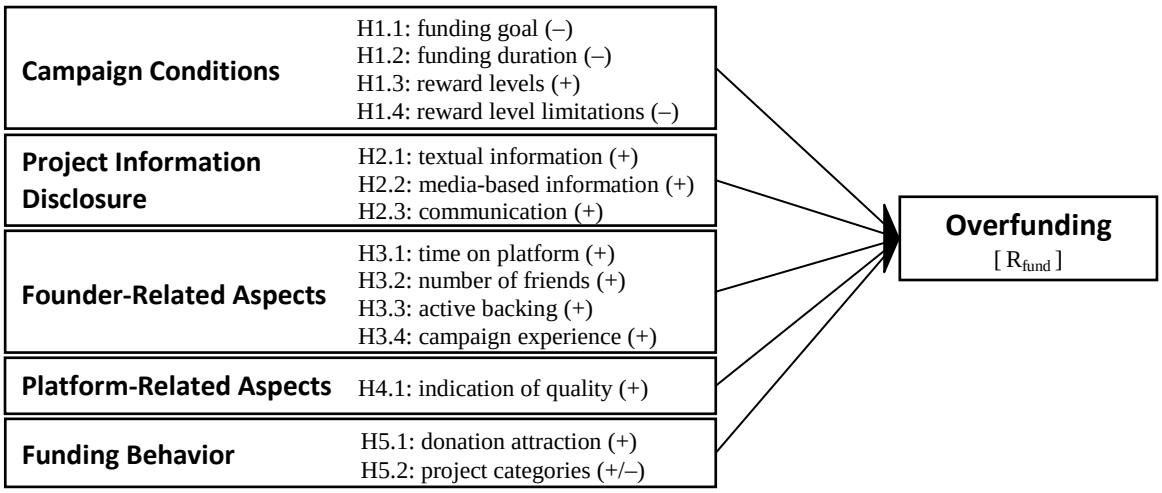

Figure 4. Overview of the research model explaining crowdfunding project overfunding

In the resulting research model (Figure 4), multiple variables are included to explain the level of overfunding of online crowdfunding projects. As we have discussed in section 2.2, research in the area of crowdfunding has revealed several variables to have an influence on the success of funding. Thus, we regard an inclusion of these variables into the research model of explaining overfunding to be vital. These variables form the first three groups of hypotheses, i.e., regarding *campaign conditions*, *project information disclosure*, and *founder-related aspects*. Moreover, by our research model, we extend the set of already well-established variables by including aspects concerning the platform operators' influence on overfunding, i.e., *platform-related aspects*, as well as *funding behavior*. The latter is included as a result of our graphical pre-analysis, which gives indication of a relation between the extent of donation-based funding and overfunding. In conformity with subsection 3.2, we measure overfunding as the fraction of the collected funding of a campaign in relation to a campaign's funding goal (R_{fund}).

3.5 Operationalization

The variables used in our regression are as follows: *Goal* is the funding goal in USD, *Duration* is the funding duration of the campaign in days (funding period), *RewardLevels* is the number of offered reward levels, *RewardLimits* is the relative amount of limited reward levels among a project's reward levels, *FullLimits* is the relative amount of reward levels that reach their limit, *WordsDescription* is the number of words of the project description, *Pictures* is the number of all pictures and graphical elements, *TitleVideo* (Boolean) indicates the existence of a title video, *Updates* is the number of update messages, *Comments* is the number of comments, *TimeOnPlatform* is the length of founder's platform membership in days, *BackedProjects* is the number of projects that the founder has backed by funding, *CreatedProjects* is the number of the founder's previously created campaigns on the platform, *FriendsDisplyed* (Boolean) indicates whether Facebook friends are displayed or not, *Friends* is the number of founder's Facebook friends (zero if not displayed), *StaffPickLabel* (Boolean) indicates the existence of a visible label revealing a staff-picked project, *DonationAttraction* is the relative amount of donation-based funding, and Cat_i (Boolean) the project category assignment.

Taking a look at the data reveals that the value levels differ substantially between the variables. Therefore, we decide to calculate the z-scores of all variables by normalization (except for Booleans). This has no influence on the quality of results (e.g., coefficient signs) or the coefficient of determination but surely on the regression coefficients. Thus, the calculated regression coefficients are brought on the same level and made more comparable. The z-score of a variable is calculated by subtracting its mean and, then, dividing by its standard deviation. Next, we present the results of our regressions.

3.6 Empirical Analysis

In an initial setup, we regressed the dependent variable R_{fund} on the set of independent variables by means of a linear regression in order to evaluate the research model. This regression resulted in a poor coefficient of determination (R^2) and surprisingly few significances. However, from our pre-analysis, we know that the distribution of the dependent variable R_{fund} is not normal but highly skewed. The data set involves many values close to the value of one but also values that are substantially higher. Such wide range of values and high skewness can lead to regressions being sensitive to outliers (Wooldridge, 2013). This problem is already well known in different contexts, e.g., in the analysis of return rates or housing prices. Wooldridge (2013) addresses this issue and suggests that "using a transformation, especially taking the log, yields a distribution that is closer to normal". We followed this advise and regressed ln(R_{fund}) on the independent variables and found both significances and a satisfying coefficient of determination. In detail, we apply the following set up (Model 7):

$$\begin{aligned}\ln(R_{fund}) = {} & \beta_0 + \beta_1 \cdot \ln(Goal) + \beta_2 \cdot Duration + \beta_3 \cdot RewardLevels + \beta_4 \cdot RewardLimits \\ & + \beta_5 \cdot FullLimits + \beta_6 \cdot WordsDescription + \beta_7 \cdot Pictures + \beta_8 \cdot TitleVideo \\ & + \beta_9 \cdot Updates + \beta_{10} \cdot Comments + \beta_{11} \cdot TimeOnPlatform + \beta_{12} \cdot Friends \\ & + \beta_{13} \cdot FriendsDisplayed + \beta_{14} \cdot BackedProjects + \beta_{15} \cdot CreatedProjects \\ & + \beta_{16} \cdot StaffPickLabel + \beta_{17} \cdot DonationAttraction + \sum_{i=1}^{15} \beta_{17+i} \cdot Cat_i + ErrorTerm\end{aligned} \quad (1)$$

The evaluation of our research model reveals several significant influences of the included variables on project overfunding. The regressions clearly show which factors drive or inhibit overfunding. Moreover, we run in total seven different regression set ups (Model 1 to 8) in order to examine how good the variables can explain overfunding (coefficient of determination). In the course of our evaluation, we have checked the correlations between the variables and find that all correlations are below 0.56. We also checked the variance inflation factors (VIFs) and found that all factors are below 2.9 which indicates no problematic multicollinearity effects between the variables (Wooldridge, 2013).

	Depend. Variable:	**Model 1**			**Model 2**			**Model 3**			**Model 4**			**Model 5**			**Model 6**			**Model 7**			**Model 8**		
	ln (overfunding)	*Coeff.*	*p-Val.*	*Sig.*	*Coeff.*	*p-Val.*	*Sig.*	*Coeff.*	*p-Val.*	*Sig.*	*Coeff.*	*p-Val.*	*Sig.*	*Coeff.*	*p-Val.*	*Sig.*	*Coeff.*	*p-Val.*	*Sig.*	*Coeff.*	*p-Val.*	*Sig.*	*Coeff.*	*p-Val.*	*Sig.*
H1.1	**ln(Goal)**	-0.158	0.000	***							-0.194	0.000	***	-0.200	0.000	***	-0.311	0.000	***	-0.316	0.000	***	-0.301	0.000	***
H1.2	**Duration**																0.013	0.021	**	0.013	0.018	**	0.020	0.000	***
H1.3	**RewardLevels**																0.044	0.000	***	0.043	0.000	***	0.016	0.001	***
H1.4	**LevelLimits**																-0.038	0.000	***	-0.038	0.000	***	-0.033	0.000	***
H1.4	**FullLimits**																-0.047	0.000	***	-0.048	0.000	***	-0.059	0.000	***
H2.1	**WordsDescription**																0.048	0.000	***	0.049	0.000	***	0.057	0.000	***
H2.2	**Pictures**																0.050	0.000	***	0.050	0.000	***	0.095	0.000	***
H2.2	**TiteVideo**																0.061	0.000	***	0.066	0.000	***	0.040	0.003	***
H2.3	**Updates**																0.099	0.000	***	0.101	0.000	***	0.107	0.000	***
H2.3	**Comments**																0.045	0.000	***	0.044	0.000	***	0.043	0.000	***
H3.1	**TimeOnPlatform**																0.023	0.000	***	0.026	0.000	***	0.016	0.000	***
H3.2	**Friends**																0.007	0.082	*	0.027	0.000	***	0.010	0.018	**
H3.2	**FriendsDisplayed**																			-0.101	0.000	***	-0.098	0.000	***
H3.3	**BackedProjects**																0.016	0.000	***	0.017	0.000	***	0.020	0.000	***
H3.4	**CreatedProjects**																0.028	0.000	***	0.027	0.000	***	0.031	0.000	***
H4.1	**StaffPickLabel**										0.182	0.000	***				0.111	0.000	***	0.116	0.000	***	0.142	0.000	***
H5.1	**DonationAttraction**				-0.195	0.000	***							-0.155	0.000	***	-0.113	0.000	***	-0.111	0.000	***	-0.129	0.000	***
H5.2	**Cat_1 (Art)**							*omitted*			*omitted*			*omitted*			*omitted*			*omitted*					
H5.2	**Cat_2 (Comics)**							0.129	0.000	***	0.174	0.000	***	0.096	0.001	***	-0.092	0.001	***	-0.088	0.001	***			
H5.2	**Cat_3 (Crafts)**							0.381	0.000	***	0.281	0.000	***	0.250	0.000	***	0.178	0.000	***	0.188	0.000	***			
H5.2	**Cat_4 (Dance)**							-0.204	0.000	***	-0.127	0.000	***	-0.002	0.951		0.042	0.201		0.033	0.319				
H5.2	**Cat_5 (Design)**							0.396	0.000	***	0.526	0.000	***	0.469	0.000	***	0.376	0.000	***	0.376	0.000	***			
H5.2	**Cat_6 (Fashion)**							0.099	0.001	***	0.194	0.000	***	0.157	0.000	***	0.136	0.000	***	0.143	0.000	***			
H5.2	**Cat_7 (Film&Video)**							-0.167	0.000	***	-0.052	0.009	***	-0.029	0.130		-0.015	0.410		-0.018	0.333				
H5.2	**Cat_8 (Food)**							-0.011	0.668		0.046	0.055	*	0.036	0.123		0.067	0.002	***	0.076	0.000	***			
H5.2	**Cat_9 (Games)**							0.562	0.000	***	0.657	0.000	***	0.583	0.000	***	0.238	0.000	***	0.237	0.000	***			
H5.2	**Cat_10 (Journalism)**							0.003	0.966		0.010	0.868		0.061	0.302		0.104	0.058	*	0.100	0.067	*			
H5.2	**Cat_11 (Music)**							-0.165	0.000	***	-0.082	0.000	***	-0.074	0.000	***	-0.010	0.575		-0.018	0.306				
H5.2	**Cat_12 (Photogr.)**							-0.051	0.160		0.005	0.882		-0.013	0.696		0.004	0.905		0.006	0.855				
H5.2	**Cat_13 (Publishing)**							-0.031	0.179		0.017	0.452		0.010	0.632		-0.015	0.454		-0.012	0.559				
H5.2	**Cat_14 (Technol.)**							0.454	0.000	***	0.625	0.000	***	0.560	0.000	***	0.491	0.000	***	0.488	0.000	***			
H5.2	**Cat_15 (Theater)**							-0.209	0.000	***	-0.135	0.000	***	-0.047	0.076	*	0.016	0.514		0.006	0.822				
	Constant	0.392	0.000	***	0.532	0.000	***	0.362	0.000	***	0.266	0.000	***	0.385	0.000	***	0.205	0.000	***	0.163	0.000	***	0.372	0.000	***
	Prob > F	0.000			0.000			0.000			0.000			0.000			0.000			0.000			0.000		
	R2	0.045			0.096			0.150			0.213			0.265			0.361			0.365			0.324		
	adj.R2	0.045			0.096			0.149			0.212			0.264			0.360			0.364			0.324		

*Table 1. Regression results (coefficient, p-value, significance: * p<0.1, ** p<0.05, *** p<0.01)*

Remark: Every project is assigned to a project category (e.g., Art, Comics, etc.). Each of these categorical variables can be composed by linear combination of all other categorical variables. Therefore, variable Cat_1 is omitted to avoid collinearity.

Campaign Conditions: The funding goal of a campaign is negatively related to overfunding (H1.1: p-val. < 0.01). This supports the – more or less obvious – hypothesis that a higher funding goal leads to a lower overfunding. This finding is in line with the research literature on crowdfunding success. However, previous research has shown that the duration of the campaign is negatively correlated to funding success (Mollick, 2014; Kuppuswamy and Bayus, 2013). Interestingly, the duration of a crowdfunding campaign has no negative influence on overfunding (H1.2: not supported). In our analysis, we find that a longer funding period of successfully funded campaigns leads to stronger overfunding (p-val. < 0.05). We conclude that – in case of successful campaigns – longer funding periods are not interpreted as a signal of bad quality or as lack of confidence among project founders. Instead, the longer a campaign is open to be backed by funding, the more funders can use their opportunity to fund the project. Overfunding is also higher, the broader rewards' range of choice (H1.3: p-val. < 0.01). This is in line with the literature on funding success (Crosetto and Regner, 2014; Barbi and Bigelli, 2015). On the contrary, it is shown that limiting reward levels inhibits overfunding of projects (H1.4: p-val. < 0.01) because reward limitations prevent rewards from being massively selected by funders.

Project Information Disclosure: Research has shown that a good description of projects by informative texts, pictures, and videos reduce funders' uncertainty and foster trust towards project founders (Koch and Siering, 2015). Our analysis reveals these hypotheses to be also valid for overfunding. The longer the project descriptions (H2.1: p-val. < 0.01) and the more pictures (H2.2: p-val. < 0.01), the higher is project overfunding. Also the existence of a title video has a positive influence on overfunding (H2.2: p-val. < 0.01). These results indicate that the more information is provided, the more funders decide to fund the project. Also communication (i.e., updates and comments) has a positive influence on overfunding (H2.3: p-val. < 0.01). In our opinion, such communication can drive overfunding in multiple ways. First, information on project progress can be provided by the founders, which generates trust and lowers funding hesitation. Second, communication is pivotal in online communities. Potential funders feel involved when there is an active community around the project. Furthermore, the number of comments represents the activeness of projects' community. Such activity drives the electronic word of mouth that can activate new potential funders via social media. And, third, the messages can be posted in a style that requests the crowd to continue funding, e.g., in case of stretched goals.

Founder-Related Aspects: It has already been shown that founder-related aspects have an influence on funding success (Mollick, 2014; Koch and Siering, 2015; Zvilichovsky et al., 2014). Our analysis reveals that such aspects also have an influence on the level of overfunding. Here, we find that the length of founders' platform membership has a positive influence on overfunding (H3.1: p-val. < 0.01). We explain this result by a positive relation between the length of membership and a higher degree of connectedness to other platform members. Moreover, the longer a founder is active on the platform, the easier people develop trust towards him/her. Concerning the number of Facebook friends, research has found that a higher number of friends has a positive influence on funding success. In our analysis, we also find that the number of friends positively influence overfunding (H3.2: p-val. < 0.01). However, the coefficient of displaying the number of friends is negative (p-val. < 0.01). This means that displaying a low number of friends inhibits overfunding while hiding this low number of friends leads to higher overfunding. Comparable results have been found in the context of funding success (Mollick, 2014).

Platform-Related Aspects: The influence of crowdfunding platforms on funding processes has not yet been addressed substantially in research. We hold it to be vital to regard the possible influence that the platform can have on the funding results. Here, our analysis reveals a positive influence of indication of quality on overfunding (H4.1: p-val. < 0.01). This finding suggests the possibility that platform operators can selectively push projects' funding forward.

Funding Behavior: Concerning funding behavior, we find that projects that are funded more altruistically, i.e., projects that attract relatively more donation-based funding instead of reward-based funding, have a lower overfunding. The higher the extent of donation-based funding of a project, the lower is the overfunding (H5.1: p-val. < 0.01). In other words, the more a project attracts reward-based funding, the more it is overfunded. Moreover, we find certain categories of projects (e.g., Technology, Design, Games) that are significantly more overfunded (H5.2: p-val. < 0.01). We assume that especially here funders are keen on the project items or follow pre-selling campaigns.

3.7 Discussion and Limitations

The results presented give evidence that several factors contribute to overfunding. These findings are, for example, interesting for project founders who favor a higher overfunding because they intend to gain publicity and sell products or have planned stretched goals. These founders can increase overfunding by regarding the findings of this study. Projects tend to be more overfunded if founders offer more levels of rewards, provide more information (in form of texts, pictures, and videos), communicate actively, and reveal a high numbers of friends, of other backed campaigns, and of created projects. Secondly, the platform can influence funding results by their actions. If a project campaign promise to contribute substantially to platform's revenue by its powerful funding growth, the platform could place this project more prominently on the websites or indicate quality by labels to further sup-

port it's overfunding. In contrast, operators can also decide to support especially those projects that have not yet reached their funding goal but are worth funding. Such a concept could help more projects to reach the funding goal but would inhibit publicity generation and product selling. Third, while funders that focus on rewards tend to increase overfunding, altruistic motives lead to less overfunding. This result can be explained by funders reacting to very inviting rewards. The more attractive the rewards are, the more the funders try to profit from the rewards and continue funding in order to get the rewards – although the campaign might already has reached its funding goal. Reward-focusing funders do not solely intend to help funding the project but also wish to profit and benefit from offered rewards. This can be interpreted as a more egoistic behavior in contrast to altruistic behavior of funders donating to campaigns. For projects that invite relatively more altruistic funders, the opposite is found: the more a project is funded altruistically, the less it tends to overfundedness. This let us conclude that altruistic funders especially feel good in helping projects to reach their funding goal. The moment projects have reached their goal, altruistic founders feel less emotionally satisfied when funding. If a project is already funded, altruistic funders do not longer strongly contribute to further (over-)funding. In this case, the altruistic founder might search for another project that needs support to reach its goal.

Our empirical findings are, of course, limited to the available data and the platform analyzed. However, we argue that stakeholders contribute to overfunding similarly on other crowdfunding platforms in a comparable cultural context. As we only regard project that are denoted in USD, further research is needed to investigate potential cultural differences. Second, in our analysis, the influence of platforms is only represented by labels that indicate project quality. Here, other possible influences could be considered, e.g., the position of projects in the listings and overview pages on the platform.

4 Conclusion

Although project overfunding is known as a phenomenon, there has not yet been profound scientific discussion focusing on the question of which factors drive overfunding of projects on online crowdfunding platforms. By our analysis, we close this research gap and show that campaign conditions, project information disclosure, founder-related, and platform-related aspects as well as funding behavior contribute to an explanation of project overfunding. We find indication that stakeholders' egoistic behavior is a natural driver of project overfunding. For example, some project founders try to reach a higher overfunding intentionally. Some funders focus on rewards and drive overfunding by continuing to fund in order to receive these rewards. Platform operators might favor a higher revenue generated through overfunding. In contrast, altruistically motivated funders seem to be satisfied most if their funding contribution helps a project to reach its goal instead of contributing to further overfunding. Our findings extend the knowledge on funding behavior in the area of online crowdfunding and are of high importance for practitioners as well. The results are, for example, of high interest for project founders who aim at the generation of publicity or a successful pre-selling campaign and, thus, welcome overfunding. Moreover, our findings help to better understand the funding processes and funding outcomes on crowdfunding platforms. However, so far, it is not clear when crowdfunding reaches optimal outcomes for all stakeholders concerned because crowdfunding platforms are used for completely different purposes by its stakeholders. For example, platform operators either focus on revenue or help campaigns altruistically without aiming at maximizing own benefits; funders either focus on rewards that are offered or prioritize backing campaigns to help them reaching their funding goal; and project founders either aim at completing (e.g., social or cultural) projects or at using crowdfunding as a distribution channel for their products or as an advertizing initiative. As a result, it is difficult to answer the question of how the best overall utility of crowdfunding can be achieved. We encourage discussion on how crowdfunding platforms optimally serve all its participants and how overall utility can be optimized. Particularly interesting would be an answer to the question of whether pre-selling and advertizing campaigns adversely affect, for example, cultural, social, and hobby projects, by a massive absorption of funding. We invite research to examine the quality of funding outcomes on crowdfunding platforms taking into account all stakeholders' interests and purposes.

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